

WE CLAIM:

1 1. In an electrochemical cell which includes an
2 electrode stack comprised of alternating conductive and
3 insulating layers extending in a first direction, wherein at
4 least a first layer extends from a first end of said stack,
5 the improvement comprising:

6 a tab connection portion comprising at least a
7 section of said first layer which is folded so as to extend
8 in a direction substantially transverse to said first
9 direction.

1 2. The electrochemical cell according to claim 1,
2 wherein said electrode stack comprises a jelly-roll type
3 electrode stack having a longitudinal axis, said jelly roll
4 stack comprising said conductive and insulating layers
5 wherein said first layer comprises a spiral electrode at a
6 first end of the stack, said tab connection portion
7 including portions of first spiral electrode that are folded
8 so as to extend in a radial direction.

1 3. The electrochemical cell according to claim 2,
2 wherein said section that is folded extends in a direction
3 substantially perpendicular to said longitudinal axis.

1 4. The electrochemical cell according to claim 2,
2 further comprising a pair of slits in said first spiral,
3 wherein said tab connection portion is located between said
4 slits.

1 5. An electrochemical cell comprising:
2 a first conductive sheet having a first end and a
3 second end opposite to said first end;
4 insulation adjacent to said first conductive sheet
5 so that said second end of said first conductive sheet is
6 uncovered by said insulation;

7 a second conductive sheet having a first end, and
8 a second end opposite to said first end of said second
9 conductive sheet, wherein said second conductive sheet is
10 adjacent said insulation so that said second end of said
11 second conductive sheet is uncovered by said insulation and
12 extends beyond said first end of said first conductive
13 sheet;

14 a tab connection portion, wherein said tab
15 connection portion includes at least one first conductive
16 sheet section that is folded so as to extend across said
17 insulation toward said second conductive sheet.

1 6. The electrochemical cell according to claim 5,
2 wherein said first conductive sheet, said insulation and
3 said second conductive sheet are rolled together to form a
4 jelly-roll stack having a longitudinal axis such that said
5 second end of said first conductive sheet forms a first
6 spiral space, and said at least one first conductive sheet
7 section extends across a portion of said first spiral space.

1 7. The electrochemical cell according to claim 6,
2 wherein said second end of said second conductive sheet
3 forms a second spiral space.

1 8. The electrochemical cell according to claim 6,
2 further comprising a pair of slits in said first spiral,
3 wherein said tab connection portion is located between said
4 slits.

1 9. The electrochemical cell according to claim 8,
2 wherein the slits which form said pair of slits are
3 substantially parallel.

10. The electrochemical cell according to claim 6,
2 wherein said tab connection portion lies substantially in a
3 plane below said second end of said first conductive sheet.

11. The electrochemical cell according to claim 6,
2 wherein each folded first conductive sheet section extends
3 from a bend towards the longitudinal axis of the stack.

12. The electrochemical cell according to claim 6,
2 further comprising a conductive tab, wherein said conductive
3 tab is connected to said tab connection portion.

13. The electrochemical cell according to claim 12,
2 wherein said conductive tab is connected to said tab
3 connection portion by a weld joint.

14. The electrochemical cell according to claim 12,
2 wherein said conductive tab is made of the same material as
3 said first conductive sheet.

15. The electrochemical cell according to claim 6,
2 further comprising a plurality of tab connection portions
3 comprised of first conductive sheet sections that are folded
4 so as to extend across a portion of said first spiral space.

16. The electrochemical cell according to claim 15
2 further comprising a plurality of pairs of slits in said
3 second end of said first conductive sheet, wherein a tab
4 connection portion is located between each pair of slits.

17. The electrochemical cell according to claim 15,
2 further comprising a conductive tab connected to each tab
3 connection portion.

1 18. The electrochemical cell according to claim 15,
2 further comprising a plurality of tab connection portions on
3 said second end of said second conductive sheet.

1 19. The electrochemical cell according to claim 18,
2 wherein the number of tab connection portions on said second
3 end of said first conductive sheet is equal to the number of
4 tab connection portions on said second end of said second
5 conductive sheet.

1 20. The electrochemical cell according to claim 6,
2 further comprising a hollow mandrel at the center of the
3 jelly-roll stack around which said first conductive sheet,
4 second conductive sheet, and said insulation are wound.

1 21. The electrochemical cell according to claim 6,
2 further comprising a conductive coating on said tab
3 connection portion.

1 22. The electrochemical cell according to claim 21,
2 wherein said conductive coating is a thermally sprayed
3 conductive coating.

1 23. The electrochemical cell according to claim 21,
2 further comprising a conductive tab connected to said
3 conductive coating.

1 24. The electrochemical cell according to claim 6,
2 further comprising a second end tab connection portion, on
3 said second conductive sheet, wherein said second end tab
4 connection portion includes at least one second conductive
5 sheet section that is folded so as to extend across a
6 portion of said second spiral space.

1 25. The electrochemical cell according to claim 24,
2 further comprising a pair of slits in the second end of said
3 second conductive sheet, wherein said second end tab
4 connection portion is located between said pair of slits.

1 26. A method of making an electrochemical cell
2 comprising the steps of:

3 providing an electrode stack which includes a
4 first electrode extending from one end of the stack, a
5 second electrode extending from an opposite end of the
6 stack, and a longitudinal axis between said ends of the
7 stack;

8 folding at least one section of the first
9 electrode so that it extends in a direction at an angle to
10 the longitudinal axis to form a tab connection portion.

1 27. The method of according to claim 26, further
2 comprising the step of connecting a current collection tab
3 to the tab connection portion.

1 28. The method according to claim 26, further
2 comprising the step of forming a conductive coating on the
3 tab connection portion.

1 29. The method according to claim 28, wherein said
2 conductive coating is a thermally sprayed coating.

1 30. The method according to claim 28, wherein said
2 conductive coating has a surface contour on a lower surface
3 thereof conforming to a surface of said tab connection
4 portion.

1 31. The method according to claim 28, further
2 including the steps of thermally spraying a coating of
3 conductive material over said current collection tab.

1 32. The method according to claim ~~26~~, wherein said
2 step of folding at least one section of the first electrode
3 includes folding a plurality of sections of said first
4 electrode to form a tab connection portion.

1 33. The method according to claim 26, further
2 including making a pair of slits in the first electrode, and
3 said step of folding at least one section of the first
4 electrode includes folding at least one section of the first
5 electrode between said pair of slits.

1 34. The method according to claim 33, wherein said
2 step of making a pair of slits includes making a pair of
3 slits which are substantially parallel.

1 35. The method according to claim ~~26~~, wherein said
2 step of folding at least one section of the first electrode
3 includes folding at least one section of the first electrode
4 so that it extends from a bend toward the longitudinal axis.

1 36. The method according to claim ~~26~~, further
2 comprising the steps of:

3 folding at least one section of the second
4 electrode so that it extends in a direction at an angle to
5 the longitudinal axis to form a tab connection portion.

1 37. The method according to claim ~~36~~, further
2 comprising making a pair of slits in said second electrode,
3 and said step of folding at least one section of the second
4 electrode includes folding at least one section of the first
5 electrode between said pair of slits.

1 38. A method of making an electrochemical cell
2 comprising the steps of:

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providing an electrode stack which includes a first electrode having a first end and a second electrode; folding at least one section of the first electrode so that it extends below the first end of the first electrode to form a tab connection portion.

39. The method according to claim 38, further comprising making a pair of slits in the first end of the first electrode, and said step of folding at least one section of the first electrode includes folding at least one section of the first electrode between said pair of slits.

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